NH Energy Efficiency Resource Standard
2021-2023 Triennial Plan

Review of July 1 Second Draft EERS Plan

VEIC Presentation to EERS Committee
July 20, 2020

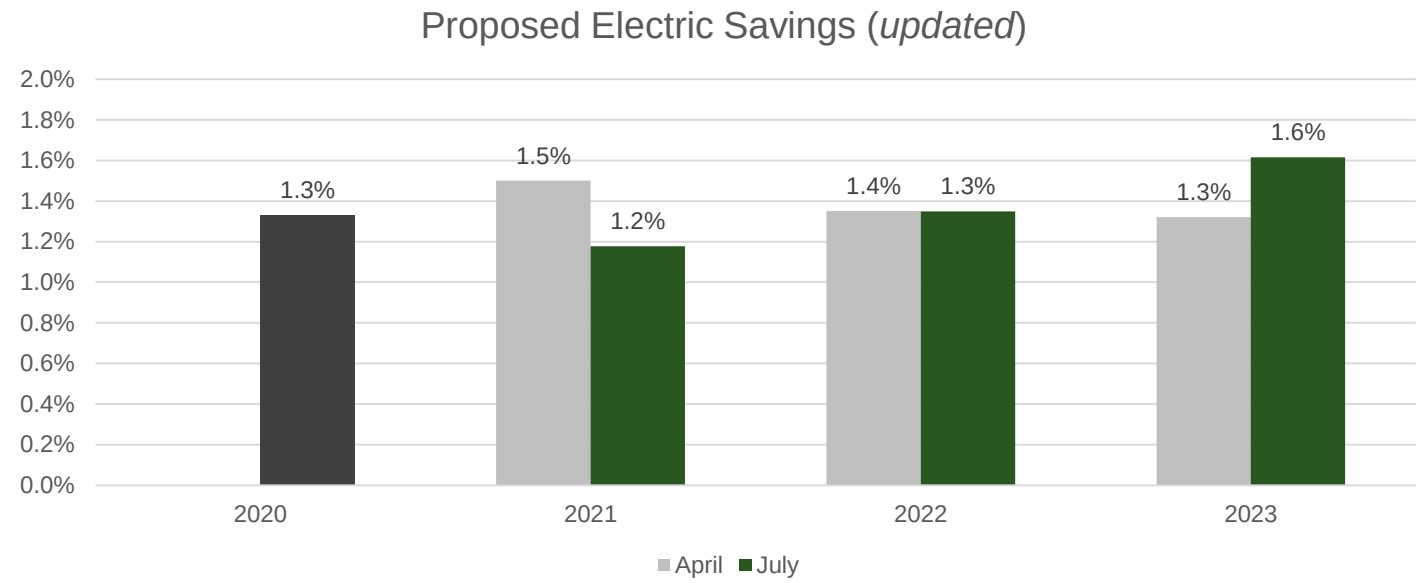
What We'll Cover

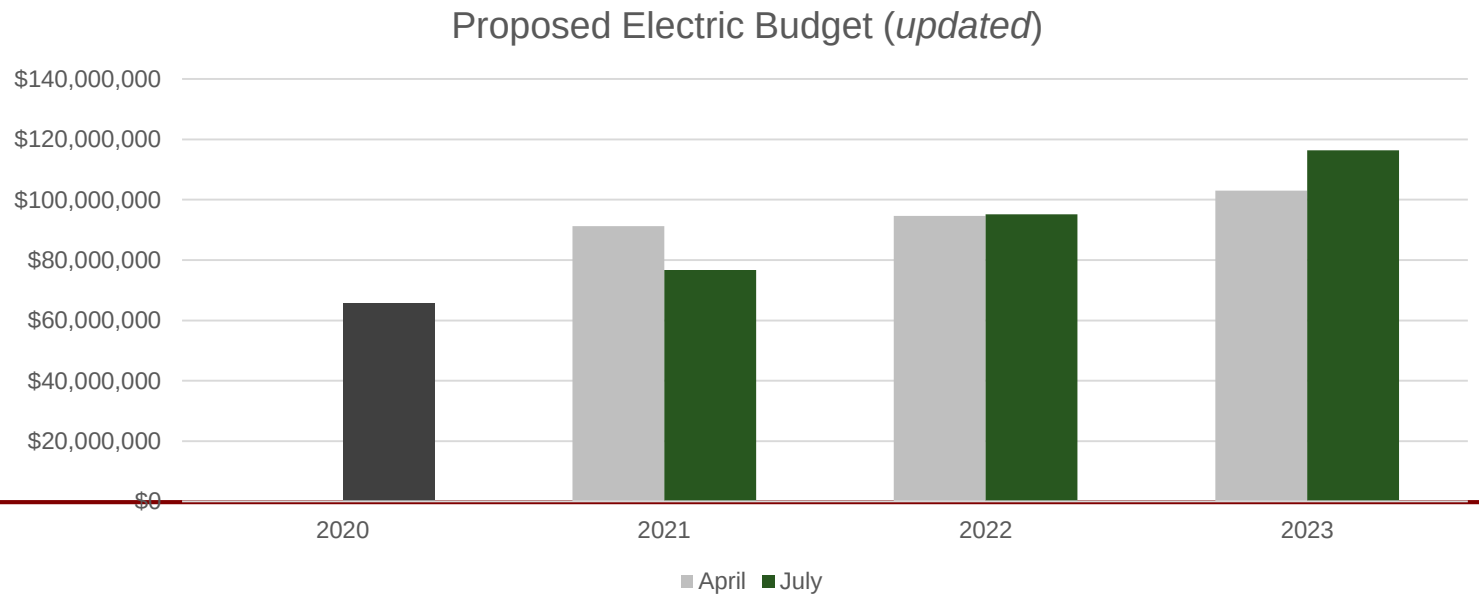
- Summary of savings and cost of savings
- Program-level review
  - Updated inclusion of key priorities in the Second Draft EERS Plan and enhancements from April plan
  - Measure-level assessment of BC model
  - Other remaining opportunities for improvement
- Brief observations on marketing, workforce development
- Review and discuss key aspects of proposed 3-year planning process
- Cross-cutting observations and conclusions

Proposed Electric Savings & Budgets *Updated*

	2020	2021	2022	2023
Residential Annual kWh	25,330,039	27,459,194	21,758,857	20,277,772
C&I Annual kWh	114,850,331	96,554,783	120,499,280	150,056,407
Total Annual kWh	**140,180,370**	**124,013,977**	**142,258,138**	**170,334,180**
Savings as a % of 2019 Sales	1.3%	1.2%	1.3%	1.6%
Residential Budget	$32,632,311	$37,272,457	$41,656,522	$46,690,128
C&I Budget	$33,059,123	$34,464,919	$45,690,847	$58,284,220
Total Budget	**$65,691,434**	**$71,737,376**	**$87,347,369**	**$104,974,348**

Proposed Electric Savings & Budgets





Cost of Savings

Programs	2020	2021	2022	2023	2023 *in April Plan*	% change in cost (2020-2023)	% savings from electric (3-yr)
Home Energy Assistance	$8.37	$7.10	$7.07	$7.57	*$9.13*	-10%	16%
Home Performance	$5.34	$5.57	$5.94	$6.17	*$5.07*	16%	9%
EnergyStar® Homes	$2.32	$1.95	$1.99	$1.98	*$2.04*	-15%	28%
EnergyStar® Products	$0.41	$0.51	$0.67	$0.77	*$0.70*	89%	85%
Residential Sub-total	***$1.31***	***$1.41***	***$2.04***	***$2.56***	***$2.50***	***95%***	***37%***
VT Res (electric budget only)	*$0.63*	*$0.69*	*$0.69*	*$0.68*		*8%*	
Large Business Solutions	$0.24	$0.33	$0.36	$0.40	*$0.39*	69%	100%
Small Business Solutions	$0.34	$0.39	$0.43	$0.42	*$0.52*	22%	100%
Municipal	$0.47	$0.53	$0.57	$0.58	*$0.63*	23%	75%
C&I Sub-total	***$0.27***	***$0.37***	***$0.40***	***$0.41***	***$0.44***	***50%***	***99%***
VT C&I (electric budget only)	*$0.39*	*$0.44*	*$0.45*	*$0.46*		*18%*	
Total (total budget)	**$0.45**	**$0.60**	**$0.64**	**$0.65**	***$0.70***	**45%**	**80%**
Total VT (electric budget)	0.48	0.51	0.52	0.53		10%	NA
Total VT (total budget)	0.57	0.61	0.62	0.63		11%	68%

Large Business: Priorities for 2021-2023

Program Priorities	Included in April Draft?	Included in July Draft?
Shift to 3-year plan to support longer-term planning with large businesses	Yes	Yes
Incorporate Strategic Energy Management	No	No
Develop “standard offer” incentives to target market segments and make it easier for customers to participate	Yes	Yes
Create multiple new construction pathways based on customer size and schedule	Yes	Yes
Expand midstream offerings	Yes	Yes

Large Business: Measure Assessment

Evaluation Criteria	Finding
Are measures offered sufficiently comprehensive? Or are there gaps?	Some industrial process measures missing: snowmaking, compressed air systems, etc.
Are the estimated quantities or penetration levels appropriate? Or over/under ambitious?	Too aggregated to evaluate in detail
Do cost estimates and incentive levels align with good industry practices?	Too aggregated to evaluate in detail
Other findings:	N/A

Large Business: Improvements & Opportunities

- Notable improvements from April draft plan:
  - Expanded customer pathways to include Whole Building and Process Tuning; New Construction pathways added
  - Expanded midstream offerings for commercial kitchen and HVAC equipment, including HPWHs and condensing units
  - Increased focus on incentivizing HVAC control technologies in the healthcare and real estate markets
- Remaining opportunities for improvement:
  - *Take advantage of longer planning horizon to offer Strategic Energy Management*
  - Offer structured incentives for low-energy snowmaking guns
  - Create a pathway for multifamily buildings to incentivize comprehensive energy approaches

Small Business: Priorities for 2021-2023

Program Priorities	Included in April Draft?	Included in July Draft?
More turnkey vendors beyond lighting	Yes	Maybe (Goal but BC model doesn't show)
Expand non-lighting measures	Yes	Maybe (Goal but BC model doesn't show)
Consider fuel-neutral incentives	No	No
Expand optimization approaches such as intelligent building controls, retro-commissioning, & demand-controlled ventilation	No	No
Encourage comprehensive projects	Yes	Yes
Expand midstream offerings	Yes	Yes
Increase workforce training	Yes	Yes

Small Business: Measure Assessment

Evaluation Criteria	Finding
Are measures offered sufficiently comprehensive? Or are there gaps?	Very little A/C, space heating (heat pump/VRF) efficiency, refrigeration, or HVAC controls
Are the estimated quantities or penetration levels appropriate? Or over/under ambitious?	**Model relies heavily on lighting.** For example looking at Eversource retrofit, 88% of TRC costs goes to lighting. Refrigeration, Motors, Process, and HVAC combined use 4% of costs, less than the costs for audits (6%). New Construction does appear to be more diverse. For reference EVT 2021-2023 plan for C&I is 20% lighting.
Do cost estimates and incentive levels align with good industry practices?	Reasonable costs for C&I portfolio as a whole, but high incentives for lighting.
Other findings:	Wide variety of measures included in midstream program, smaller volume of products

Small Business: Improvements & Opportunities

- Notable improvements from April draft plan:
  - Workforce development as a key component of market transformation
- Remaining opportunities for improvement:
  - Plan should more aggressively diversify beyond lighting to other measures
  - *Recommend more engagement with general market-based service providers (not just the turnkey vendors) to create pathways for more customer-specific or controls measures*
  - *Consider strategies to encourage comprehensiveness over time (bonus incentive for second project, outreach to prior customers for next steps)*
  - To further support rural community outreach, workforce development, and maintaining momentum during COVID, recommend continuing to offer virtual or pre-recorded trainings and info sessions to contractors and business owners

Municipal: Priorities for 2021-2023

Program Priorities	Included in April Draft?	Included in July Draft?
Increase cost-effectiveness flexibility for uneconomic projects (low operating hours, etc.)	Yes (portfolio-level screening)	Yes (portfolio-level screening)
Increase support for small, remote towns	Yes	Yes
Enable longer-term projects (common in munis) by moving vendors to 3-year goals	Encouraged	Encouraged
Expand non-lighting measures, particularly instant savings measures	Yes (low-cost measures not called out specifically)	Maybe (In concept but not supported with details or BC model)
Expand Main Street initiative and explore ways to standardize community offerings	Yes	Yes

Municipal: Measure Assessment

Evaluation Criteria	Finding
Are measures offered sufficiently comprehensive? Or are there gaps?	Majority in two large buckets: Lighting and HVAC. Many opportunities remain in HVAC controls and air infiltration.
Are the estimated quantities or penetration levels appropriate? Or over/under ambitious?	Overall, Municipal program is more diverse than small business, but still relies heavily on lighting. For example, Liberty retrofit is 100% lighting for electric savings.
Do cost estimates and incentive levels align with good industry practices?	Reasonable
Other findings:	

Municipal: Improvements & Opportunities

- Notable improvements from April draft plan:
  - No noteworthy changes
- Remaining opportunities for improvement:
  - Plan should more aggressively diversify beyond lighting to other measures
  - *Take advantage of longer planning horizon to develop long-term energy plans and encourage continual progress*
  - *With economic support needed from pandemic, consider pairing community energy blitzes with advanced workforce development training to target a specific set of measures*
  - To address COVID, consider school indoor air quality improvement or HVAC maintenance tune-up in combination with HVAC EE initiatives

ES Products: Priorities for 2021-2023

Program Priorities	Included in April Draft?	Included in July Draft?
Maintain residential lighting programs through 2021 with transition in 2022	Yes	Yes
Focus lighting programs on hard-to-reach customers and markets	Yes	Yes
Add new products	Yes	Yes
Consider fuel-neutral strategies (smart thermostats for oil/propane, integrated heat pump controls)	Yes (smart t-stats for oil/prop)	Yes (smart t-stats for oil/prop)
Expand midstream distributor incentives for HP, HPWHs, pool pumps	Yes (HPWH & pumps)	Yes (HPWH & pumps)
Increase market share of ES Most Efficient and consider Retail Products Platform	Maybe (evaluate ESRPP)	Maybe (evaluate ESRPP)
Incorporate smart home energy mgt systems & connected products	Maybe (eval. cost-effectiveness)	Maybe (eval. cost-effectiveness)

ES Products: Measure Assessment

Evaluation Criteria	Finding
Are measures offered sufficiently comprehensive? Or are there gaps?	• ESRPP would have a significant impact on budget, incentive levels and participation – how would plans be updated for inclusion? • Opportunity to build out smart home products and ENERGY STAR electronics (e.g. TVs)
Are the estimated quantities or penetration levels appropriate? Or over/under ambitious?	• ESRPP would significantly increase participation for covered products – is this included in forecasts? • Recommend more aggressive HPWH and minisplit forecasts
Do cost estimates and incentive levels align with good industry practices?	• Hard-to-Reach (HTR) incentives should be higher than standard incentives. They are the same for general service LEDs and actually lower for reflector/specialty. • Low (<$50) rebates for expensive appliances likely have limited impact (high freeridership) and high breakage. Recommend shift to ESRPP or point of sale rebates.
Other findings:	• The net-to-gross for HPWHs is extremely low (60%). With low participation and market penetration this should be much higher (comparatively washers and dryers is 100% despite high market share of ES appliances.)

ES Products: Treatment of Residential Lighting

- BC model assumptions for residential retail lighting represent a reasonable approach for lighting transition:
  - Continued high levels of general service lamps in 2021
  - Half the number of general service lamps in 2022
  - No general service lamps except hard-to-reach channels in 2023

2021-2023 Residential Retail Lighting Savings and Share of Portfolio

	2021 Lighting	2021 Share of Portfolio	2022 Lighting	2022 Share of Portfolio	2023 Lighting	2023 Share of Portfolio
Incentive/Budget	$4,688,386	6.54%	$2,462,040	2.82%	$680,344	0.65%
Net Annual Savings	14,732,644	12.24%	5,390,958	3.96%	901,612	0.56%
Net Lifetime Savings	43,419,461	3.01%	16,291,831	0.93%	1,789,134	0.08%

ES Products: Improvements & Opportunities

- Notable improvements from April draft plan:
  - Increased level of detail on partnerships and pathways to include additional high-efficiency products in the 2021-2023 program
- Remaining opportunities for improvement:
  - NH Utilities could be much more aggressive in advancing midstream strategies for non-lighting products and appliances
    - Will “look into introducing the ENERGY STAR Retail Products Platform” to increase sales, promotion, and stocking of high-efficiency appliances (e.g., refrigerators, freezers, clothes washers, dryers, room AC) sold at retail
    - Will add HPWHs and circulator pumps to midstream offering and “investigate if and when to include heat pumps”
    - Eversource BC model ramps up to 3500 heat pumps and 1750 HPWHs by 2023; for comparison, Efficiency Vermont (which serves a little more than half the number of customers) installed more than 6000 heat pumps in 2019 and 1800 HPWHs in 2018

ES Homes: Priorities for 2021-2023

Program Priorities	Included in April Draft?	Included in July Draft?
Build on the Drive to ENERGY STAR tier by incentivizing measures that will be required by code (e.g. infiltration and duct blaster thresholds)	No (specific measures not detailed)	Maybe (exploring measures)
Offer program tiers and bonus incentives for beyond ENERGY STAR: net zero, Passive House, EV-ready, Solar-ready, DR-Ready, etc.	Yes (all-electric incentive will be offered while other options will be considered)	Yes (all-electric offering and other options will be considered)
Encourage post-occupancy monitoring for high performance homes and/or P4P to encourage occupant behavior	No	Maybe (Exploring P4P)
Review current approaches for code savings attribution	Yes	Yes
Continue working with towns to get permit data to target program outreach	No	No

ES Homes: Measure Assessment

Evaluation Criteria	Finding
Are measures offered sufficiently comprehensive? Or are there gaps?	It may be helpful to break the Program paths out by Subprogram (e.g. identify incremental costs, savings, participant by tier).
Are the estimated quantities or penetration levels appropriate? Or over/under ambitious?	The plan states that 15-30% of new homes typically enroll in the ES Homes program and sets an aspirational goal of 80% ES homes by 2030. Program participation increases about 10% each year in the plan, but NH new home permits have been rising at a faster, rate, around 18% a year. If that trend continues, program participation may need to ramp even up more to achieve the 2030 goal.
Do cost estimates and incentive levels align with good industry practices?	• Total resource costs vary widely across utilities for both SF and MF homes. This may be due to varying assumptions around program tier participation rates. • Program spending statistics seem high as compared to other utility ES Homes programs (e.g. ~$4600/participant vs. ~$1600/participant in MD for electric programs; ~$2/kWh vs. ~$0.60/kWh in MD) • Incentive levels are in line with other ES Homes programs
Other findings:	

ES Homes: Improvements & Opportunities

- Notable improvements from April draft plan:
  - Bolstered language around marketing and outreach aimed at increasing participation, potentially including real estate professionals
  - Stronger language around proposing a code savings attribution model for this plan cycle
  - Stronger language around incorporating a Net Zero pathway and/or measures
- Remaining opportunities for improvement:
  - *Identify specific above-code measures and incentives for the "Drive to ENERGY STAR" pathway and "Beyond Energy Star" construction (e.g. all-electric measures, Net Zero construction tier) – the plan is noncommittal on these approaches*
  - *Offer a higher level of incentives and/or technical assistance for low-income new construction (affordable housing)*

HEA: Priorities for 2021-2023

Program Priorities	Included in April Draft?	Included in July Draft?
Expand training for CAAs and contractors	Yes	Yes
Allow NHSaves funds to be used to hire staff and buy equipment	Yes	Yes
Enable multi-year budgeting	Yes	Yes
Increase or eliminate incentive cap	Yes	Yes
Add new measures: washers, dryers, AC, dehumidifiers, HPWHs; consider HPs & PV	Yes	Yes
Ease B/C requirements for projects	Yes	Yes
Create program manual	Yes	Yes
Expand data sharing and referrals between CAAs/OSI and utilities	Yes	Yes
Implement improved data tracking system	Yes	Yes
Consider new LI programs beyond HEA	Yes	Yes

HEA: Measure Assessment

Evaluation Criteria	Finding
Are measures offered sufficiently comprehensive? Or are there gaps?	Unclear – the measures described in the program design aren't all reflected in the utilities' BC models
Are the estimated quantities or penetration levels appropriate? Or over/under ambitious?	Variable – for measures where quantities were forecast, some seemed fine while others seemed low. Many measures were not forecast at all
Do cost estimates and incentive levels align with good industry practices?	Yes – for the measures that were forecast
Other findings:	Energy savings assumptions varied across the utilities and in sometimes were much higher or lower than would be expected

HEA: Improvements & Opportunities

- Notable improvements from April draft plan:
  - Clear articulation of 4 program pathways: Comprehensive Wx, Visual Audit & Direct Install, Appliance Vouchers, and EE kits
  - Increased incentive cap from $8,000 to $20,000 with potential to go beyond cap if other resources are unavailable to cover costs
  - NH Saves Partnership Initiative working to secure grants for CAAs to overcome customer barriers to Wx (e.g., health & safety and major repairs)
- Remaining opportunities for improvement:
  - *Explain how new screening methodology and portfolio-level screening will impact CAAs ability to install more EE measures*
  - *Should Virtual Audits (offered to HPwES customers) be considered for HEA?*

HPwES: Priorities for 2021-2023

Program Priorities	Included in April Draft?	Included in July Draft?
Prioritize workforce training	Yes	Yes
Increase or eliminate cap on incentives	Yes	Yes (increased to $8K)
Allow some health & safety costs to be included	Yes	Yes
Add new measures: appliances, heat pumps, HPWHs	Yes (appliances & HPWHs)	Yes (but not consistently reflected in BC models)
Ease project-specific screening	Yes	Yes
Expand light/visual audit options to make participation easier	Yes	Yes
Enable multi-year budgeting	Yes	Yes
Roll out new audit & tracking software	Yes	Yes

HPwES: Measure Assessment

Evaluation Criteria	Finding
Are measures offered sufficiently comprehensive? Or are there gaps?	Unclear – the measures described in the program design aren't all reflected in the utilities' BC models
Are the estimated quantities or penetration levels appropriate? Or over/under ambitious?	Unclear – All utility BC models didn't include all measures described in program design
Do cost estimates and incentive levels align with good industry practices?	Unclear – cost estimates and incentive levels were extremely variable across utilities
Other findings:	Energy savings assumptions varied across the utilities and in sometimes were much higher or lower than would be expected

HPwES: Improvements & Opportunities

- Notable improvements from April draft plan:
  - Virtual Assessments as an option for initial assessments
  - Health & Safety measures will be eligible for financing (though details as to how much is unclear)
- Remaining opportunities for improvement:
  - *Contractor recruitment activities (beyond training), and the budget to support them, are unclear*
  - *Explain how Granite State Test will impact project screening from the contractor's perspective*
  - Unclear how appliance rebates will be implemented – through the contractors or just customer referrals to the ES Products incentives?

Active Demand Reduction: Improvements & Opportunities

- Notable improvements from April draft plan:
  - Additional clarification of which utilities will offer which ADR program, and when; most using performance-based incentives
  - ADR cybersecurity risk review has been completed
- Remaining opportunities for improvement:
  - Narrative lacks detail: any implementation services, data/analytics, performance optimization, customer engagement approaches?
  - No energy savings or participation targets in program budget and goals section (noted as “included in next iteration of 2021-2023 plan”)
  - Describe how EE and ADR will be coordinated and cross-promoted to maximize customer benefits; e.g. EE before batteries, integrated DSM, etc.
  - Align “Storage Performance” C&I Offering with “Battery Storage” Res Offering; articulate whether non-electric storage (e.g. ice, hot water) are viable participating resources
  - Consider behavioral/economic strategies* and incentives to customers that accompany enrollment and participation in ADR (vs per-customer performance-based incentives).
  - Unclear plan for ADR fleet data management and M&V; this is an area with a high potential for implementation challenges

*See Pratt & Erickson (2020) for results or BED Website for program example

Energy Optimization Pilot

- Strengths of plan:
  - Many additional details on structure, metrics, eligibility, targets
  - Requirement for integrated controls
  - Plan for pilot evaluation is included
- Opportunities for improvement:
  - Unclear whether limited to customers who have AC or want heat pumps for cooling (which could bias findings)
  - Requirement of 2 years of fuel data may greatly limit eligibility
  - Pilot description includes contractor outreach and training – unclear whether this is meant to be limited to those participating in pilot or applied to the full heat pump program (should be the latter)
  - Three years is a long pilot, given extensive heat pump experience in NH and neighboring states – scale more quickly?
  - Consider including a HPWH component

Workforce Development

- Strengths of plan:
  - New separate chapter outlines key objectives and approaches (includes a needs assessment and plan to recruit entrants)
  - Commitment to hire a workforce development vendor to coordinate strategic planning and implementation
  - Plan to expand C&I network to hard-to-reach areas, trainings on comprehensive savings, emerging tech, & advanced refrigeration
- Opportunities for improvement:
  - Plan for residential contractors lacks detail
  - Unclear whether plan calls for expansion of residential network to hard-to-reach areas

Marketing: Improvements & Opportunities

- Notable improvements from April draft plan:
  - Residential marketing will target limited-income and other underserved customer segments
  - The creation of a trade ally logo will increase visibility and help build trust
- Remaining opportunities for improvement:
  - *Consider integrating behavioral strategies to drive conversions (Eversource is beginning this effort), like targeting customers during major life-transitions*
  - *Consider inbound marketing, like the development of gift guides or blogs, to introduce customers to programs*

Behavioral: Improvements & Opportunities

- Notable improvements from April draft plan:
  - Liberty conducted customer testing on its Aerial Infrared Mapping (AIM) program with an online survey, thereby reducing risk
  - Use of "crop rotation" in HER may increase savings opportunities
  - M&V approach for Eversource's Customer Engagement Initiative (CEI) is still unclear, but selecting a treatment and control group may allow for savings analysis later
- Remaining opportunities for improvement:
  - Targeting underserved customers with behavior-based strategies
  - Eversource could consider running home energy reports alongside efforts to find new programs and build out the CEI strategy
  - Work closely with evaluators to develop treatment and control groups for AIM program
  - Explore how data collected for AIM platform might augment other programs beyond reporting/engagement (e.g. MyHEAT scores, GIS data)

Three-Year Planning Process: Key Elements

- Goals and budgets will be set for 3-year period as a whole, with flexibility to shift savings and budgets across years
  - Evaluations, TRM updates, and AESC results will apply prospectively to the next year within the 3-year period
  - Goals will not change unless a mid-term modification (MTM) is triggered
  - Utilities propose to allow each utility to spend up to 110% of each sector's approved 3-year budget without further PUC approval
  - PI will determined based on 3-year results, but estimated and accrued each year and reconciled after year 3 to allow for steadier collections
- Important changes to the SBC process:
  - SBC will no longer be set statewide in the EERS plan; the EERS plan will set the budget and the SBC will be set in separate rate filings for each utility
  - This means that different utilities may have a different SBC due to reconciling collections and expenditures (e.g., carryover)
  - Sectors (Residential & C&I) also have different budgets and SBCs reflecting different savings opportunities

Three-Year Planning Process: Key Elements

- For the first and second years of the term, a statewide Annual Report will be filed with the Commission
  - Annual Reports will detail the progress made by the NH Utilities individually and as a group, and project whether they are on track to achieve the 3-year goals
  - Unlike current Annual Update process, this will not trigger an adjudicative process unless the Commission wants to investigate further
- Proposed triggers for mid-term notification (no PUC approval):
  - Suspension or closure of a program
  - Shifting program term budgets more than 20% within a sector
  - Transition from a pilot offering to a full program that does not trigger MTM
  - Annual TRM filing

Three-Year Planning Process: Key Elements

- Proposed triggers for mid-term modification (requires PUC approval & can change 3-year goals, budgets, and PI):
  - Inclusion of a new program by one or more utilities
  - Increase in the 3-year budget for a sector of more than 110%
  - Projected decrease to the planned results (benefits and kWh, kW, or MMBtu savings) **in a sector** of greater than 25% over the term
  - Change to the planned results (benefits and kWh, kW, or MMBtu savings) **for the portfolio** of greater than 10% in either direction over the term resulting from one or more of the following triggers:
    - AESC study updates
    - Evaluation findings
    - Significant changes to the marketplace, or other circumstances **outside of a NH Utility's control**, which materially jeopardize achievement of the triennial plan (i.e., COVID-19 pandemic)

Cross-Cutting Observations

- July 1 Second Draft Plan has several key strengths:
  - Strong focus on increasing participation and making EE easier to access
  - Addition of solid proposals for Energy Optimization and Workforce Development
- Shift from a 1-year to a 3-year planning process is crucial to enabling longer-term planning, customer engagement strategies, and market growth
- July plan proposes similar levels of triennial savings as the April plan, but with more of a ramp-up from 2021-2023
  - However, *cumulative* three year targets (and budgets) take precedence over single year targets
- Cost-to-achieve levels are generally reasonable

Cross-Cutting Observations

- The plan takes a measured approach to lighting transition:
  - Residential: General Service lamps still supported into 2022
  - C&I: Small Business program remains heavily reliant on lighting
- A slower lighting transition keeps the costs of annual kWh down
- However, lighting is less helpful for lifetime kWh because of shorter measure lives – and continued heavy reliance on lighting may slow a necessary transition to other measures
- Program-level review suggests opportunities to increase savings through highly cost-effective non-lighting approaches:
  - Ramp up C&I Strategic Energy Management
  - Accelerate non-lighting measures in Small Business Program
  - Accelerate residential non-lighting measures through midstream approaches for appliances, heat pump water heaters, heat pumps